

REMARKS

Drawings

The Office Action indicated that FIGs. 13A-13C should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. Applicants have amended Figs. 13A-13C to include that designation.

The drawings were objected to because certain reference numerals were identified in FIGs. 13A-13C, but were not identified in the specification. Applicants have deleted those reference numbers from FIGs. 13A-13C and request acceptance of FIGs. 13a-13c.

Specification

The disclosure was objected to because of numerous informalities. Applicants have amended the specification to correct each of those informalities and request acceptance of the specification in its current form.

Claim Objections

Claims 7 and 9 were objected to because the word “planner” should have read “planar.” Applicants have amended claims 7 and 9 to correct that informality.

Claim Rejections – 35 U.S.C. §112

Claim 2 was rejected under the second paragraph of 35 U.S.C. §112 as being indefinite for allegedly failing to particularly point out and distinctly claim the subject matter which the Applicants regard as the invention. More specifically, referring to the feature “resin sealing is performed by each cavity in each block,” the Office Action indicated that none of the drawings depicts a cavity in each block.

Applicants have amended to claim 2 to clarify the subject matter of that claim and request withdrawal of the §112 rejection.

Claim Rejections – 35 U.S.C. §103

Applicants thank the Examiner for recognizing that claims 3, 5 and 9 include allowable subject matter.

Claims 1-14 are pending. Claims 1, 2, 3, 6, 7 and 9 have been amended. New claims 12-14 have been added. Support for new claims 12-14 can be found, for example, in FIG. 5B. No new matter has been added.

Claims 1, 2, 4, 7, 8 and 11 were rejected as being unpatentable over the combination of U.S. Patent No. 6,767,767 (Hayashida et al.) and U.S. Patent No. 5,924,190 (Lee et al.).

Claim 1 recites forming conductive patterns on a planar body and disposing a circuit element on a mounting portion formed by those conductive patterns. An example of that feature is shown in FIGs. 3B and 4 where conductive patterns 21 form mounting portions 15 on a planar body 10. Circuit elements 22A and 22B are disposed on the mounting portions 15 of those conductive patterns. Neither the Hayashida et al. patent nor the Lee et al. patent discloses or suggests that feature.

The Hayashida et al. patent discloses a method of manufacturing a semiconductor device that includes securing semiconductor chips 10 to a substrate 20 with an adhesive layer 12. (*See* FIG. 1 and FIG. 6B) Multiple connecting portions (lands) 3 are exposed on a main surface 2X of the substrate 20. Resin sealing includes bringing a lower mold 30B into contact with a back surface 2Y of the substrate 20 and covering the upper surface 2X of the substrate 20 and the semiconductor chips 10 with resin. (*See* FIG. 1) The resulting structure is separated to form individual semiconductor devices 1A. (*See* FIG. 6(B) and column 13, line 66-column 14, line 11)

The semiconductor chips 10 disclosed in the Hayashida et al. patent are not disposed on conductive patterns. The semiconductor chips 10 are merely positioned atop a substrate 20. Although conductive connecting portions 3 are exposed at an upper surface 2X of the substrate 20, the semiconductor chip 10 is not disposed on those connecting portions 3.

The Lee et al. patent discloses a method of manufacturing an encapsulated integrated circuit that includes positioning a die 10 atop a thermally conductive heat sink 12. The die 10 and heat sink 12 are then positioned inside a mold 24 that includes an upper cavity half 20 and a bottom cavity half 22, both of which include air vents 26 and 27. (*See* FIG. 1) Mold compound is injected through a gate (at 25 in FIG. 1). Some of the molten mold material enters the bottom cavity half 22. During injection of the mold compound, gas is expelled from the mold cavity through the air vents 26 and 27. (*See* column 1, line 65 – column 2, line 2)

The die 10 disclosed in the Lee et al. patent is not disposed on conductive patterns. Instead, the die 10 is coupled to a flat upper surface of a thermally conductive heat sink 12. (*See* FIG. 1) The heat sink 12 does not include a conductive pattern.

Claim 1 should be allowable for at least the foregoing reasons.

Claim 1 also should be allowable for the following additional reasons.

Claim 1 recites bringing a backface of the planar body into contact with a lower mold having air vents. An example of that is illustrated in FIG. 5B where a backface of a planar body 10 is brought into contact with the air vents 30 of the lower mold 28A. The illustrated air vents 30 allow the release of air from the space between the planar body 10 and the lower mold 28A. As discussed, for example, on page 15, lines 5-9, implementing that feature may in some instances prevent the accumulation of air beneath the planar body 10 during resin sealing. By preventing the accumulation of such air, warping of the planar body during resin sealing may be avoided.

Neither the Hayashida et al. patent nor the Lee et al. patent discloses or suggests that feature. Indeed, the Office Action itself concedes that the Hayashida et al. patent fails to disclose a lower mold having an air vent. (*See* Office Action, paragraph 8A, page 6) Nor does the Lee et al. patent disclose a backface of a planar body being brought into contact with a lower mold having air vents. Referring, for example, to FIG. 1 of the Lee et al. patent, a lower surface of the heat sink 12 is not in contact with a lower mold having an air vent. Accordingly, if air becomes

trapped beneath the heat sink 12 during the injection of mold compound, damage to the heat sink 12, the die positioned above the heat sink 12 and the resulting integrated circuit could result.

Claim 1 should be allowable for at least the foregoing additional reasons.

Nor would it have been obvious to modify the disclosures of the cited references to obtain the subject matter recited in claim 1.

A claimed invention is unpatentable due to obviousness if the differences between it and the prior art "are such that the subject matter as a whole would have been obvious at the time the invention was made to a person of ordinary skill in the art." 35 U.S.C. § 103(a).

As discussed by the Court of Appeals for the Federal Circuit, a proper conclusion of obviousness under 35 U.S.C. § 103 requires that there be some motivation in the prior art that suggests the claimed invention as a whole:

[A]n Examiner may often find every element of a claimed invention in the prior art. If identification of each claimed element in the prior art were sufficient to negate patentability, very few patents would ever issue. Furthermore, rejecting patents solely by finding prior art corollaries for the claimed elements would permit an examiner to use the claimed invention itself as a blueprint for piecing together elements in the prior art to defeat the patentability of the claimed invention. Such an approach would be "an illogical and inappropriate process by which to determine patentability." [Citations omitted] To prevent the use of hindsight based on the invention to defeat patentability of the invention, this court requires the examiner to show motivation to combine the references that create the case of obviousness.

In re Rouffet, 149 F.3d 1350, 1357; 47 USPQ2d 1453, 1457-1458 (Fed. Cir. 1998). As further explained by the Federal Circuit:

Our case law makes clear that the best defense against hindsight-based obviousness analysis is the rigorous application of the requirement for a showing of a teaching or motivation to combine the prior art references. See *Dembiczak*, 175 F.3d at 999, 50 USPQ2d at 1617. "Combining prior art references without evidence of such a suggestion, teaching, or motivation simply

takes the inventor's disclosure as a blueprint for piecing together the prior art to defeat patentability--the essence of hindsight." Id.

"When a rejection depends on a combination of prior art references, there must be some teaching, suggestion, or motivation to combine the references." In re Rouffet, 149 F.3d 1350, 1355, 47 USPQ2d 1453, 1456 (Fed. Cir. 1998) (citing In re Geiger, 815 F.2d 686, 688, 2 USPQ2d 1276, 1278 (Fed. Cir. 1987)).

Ecolochem, Inc. v. Southern California Edison Co., 56 USPQ2d 1065, 1072-73 (Fed. Cir. 2000).

The showing of the motivation to combine must be "clear and particular." *See, e.g., C.R. Bard, Inc. v. M3 Sys., Inc.*, 157 F.3d 1340, 1352, 48 USPQ2d 1225, 1232 (Fed. Cir. 1998); *Teleflex, Inc. v. Ficosa North Am. Corp.*, 63 USPQ2d 1374 at 1387 (Fed. Cir. 2002).

None of the cited references suggests the desirability of removing air pockets from between a planar body and a lower mold to prevent warping of the planar body during resin sealing. Accordingly, those references would not have provided a person of ordinary skill in the art with the requisite clear and particular motivation that would suggest the subject matter of claim 1.

Claim 1 should be allowable for the foregoing additional reasons as well.

Claims 2, 4, 7, 8 and 11 depend from claim 1 and, therefore, should be allowable for at least the same reasons as claim 1.

It is believed that all of the pending claims have been addressed. However, the absence of a reply to a specific rejection, issue or comment does not signify agreement with or concession of that rejection, issue or comment. In addition, because the arguments made above may not be exhaustive, there may be reasons for patentability of any or all pending claims (or other claims) that have not been expressed. Finally, nothing in this paper should be construed as an intent to concede any issue with regard to any claim, except as specifically stated in this paper, and the amendment of any claim does not necessarily signify concession of unpatentability of the claim prior to its amendment.

Applicant : Noriyasu Sakai et al.
Serial No. : 10/667,681
Filed : September 22, 2003
Page : 15 of 15

Attorney's Docket No.: 14225-022001 / F1030476US00

No fee is believed to be due. However, please apply any charges or credits to deposit account 06-1050.

Respectfully submitted,

Date: 7/8/05



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Amendments to the Drawings:

The attached replacement sheet of drawings includes changes to Fig. 13A, Fig. 13B and Fig. 13C and replaces the original sheet including Fig. 13A, 13B and 13C.

In Figure 13A, reference numerals 121C and 125B have been deleted and the designation "Prior Art" has been added.

In Figure 13B, reference numeral 117 has been deleted and the designation "Prior Art" has been added.

In Figure 13C, reference numerals 115, 117 and 129 have been deleted and the designation "Prior Art" has been added.

Attachments following last page of this Amendment:

Replacement Sheet (1 page)
Annotated Sheet Showing Change(s) (1 page)

Annotated Sheet Showing Changes

FIG.13A

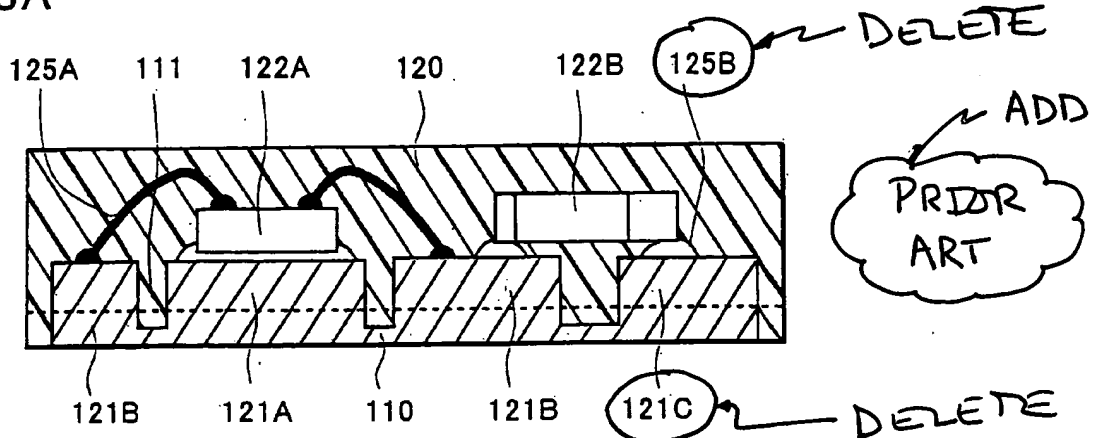


FIG.13B

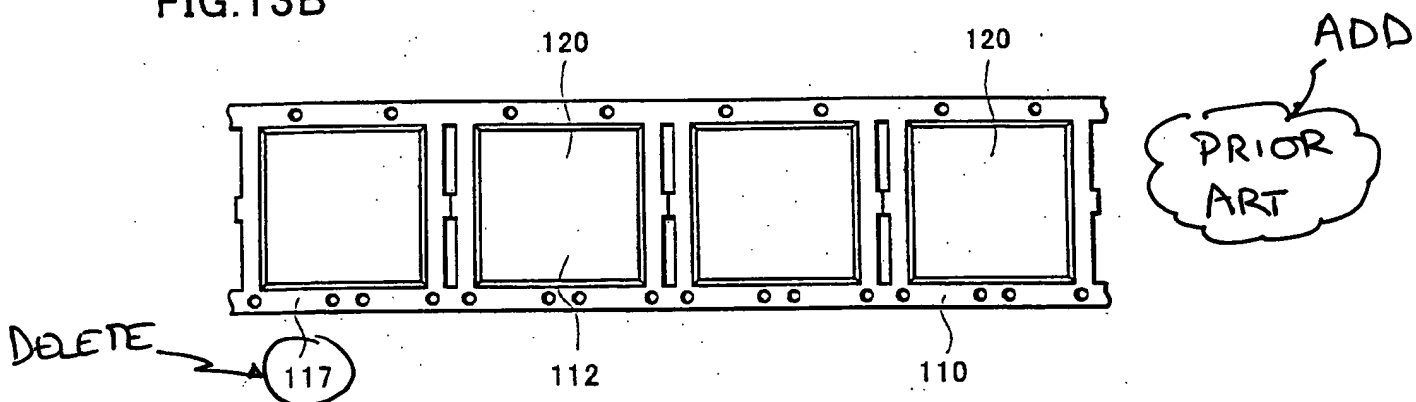


FIG.13C

